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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/717,059

11/18/2003

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EXAMINER

LIEW, ALEX KOK SOON

ART UNIT

PAPER NUMBER

2624

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No.		Applicant(s)	
	10/717,059		ODAGAWA ET AL.	
	Examiner		Art Unit	
	Alex Liew		2624	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 – 4, 7, 9, 15 – 18, 21 and 22 are rejected under U.S.C. 102(e) as being anticipated by Ganapathi (US pat no 7,073,397).

With regards to claim 1, Ganapathi discloses a reader for reading a shape if a surface of an object comprising

- a magnetic displacement portion, wherein when the magnetic displacement portion comes into contact with surface of the object, a magnetic state of the magnetic displacement portion differs depending on the shape of the surface (see column 5 lines 48 – 57 – there is a displacement in magnetic field when there is force applied to the sensor, plot shown in figure 2 and 4) and

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- a detecting portion, detecting portion detects the magnetic of the magnetic displacement (see figure 6 – is a detecting portion which detects force applied).

With regards to claim 2, Ganapathi discloses a reader according to claim 1, wherein the shape of the surface includes a convex portion and a concave portion (the object in the invention being used is the human finger, see column 3 lines 38 – 42, the shape of the finger is curve with some degree of roundness depending on the individual) and the magnetic state of the magnetic displacement portion differs between a region facing the convex portion and a region facing the concave portion due to a pressure generated by contact of the surface with the magnetic displacement portion (see column 5 lines 48 – 55 – when force or pressure is applied to the sensor, there is a displacement of magnetic field parallel to the finger sensor, shown in figure 6, the stress is shown in the plot in figure 4).

With regards to claim 3, Ganapathi discloses a reader according to claim 2, wherein the magnetic displacement portion comprises a transition material for converting mechanical energy into magnetic energy (see column 5 lines 31 – 33).

With regards to claim 4, Ganapathi discloses a reader according to claim 3, wherein the transition material comprises a magneto-strictive material (see column 5 lines 31 – 33).

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With regards to claim 7, Ganapathi discloses the soft magnetic layer and the transition material are coupled magnetically (see column 5 lines 17 – 21) and a magnetic state of the soft magnetic layer differs depending on a magnetic state of the transition material (see column 5 lines 14 – 16 – the unlaminated annoy conducts different magnetic displacement than the laminated annoy).

With regards to claim 9, Ganapathi discloses a reader according to claim 1, wherein the detecting portion comprises a magneto resistive element and detects the magnetic state by using magnetiresistive element (see column 4 lines 33 – 35).

With regards to claim 15, Ganapathi discloses a reader according to claim 1, wherein magnetic displacement portion is fixed in a direction perpendicular to the surface of the object (see figure 6 – the finger in placed on top of the sensor, for example shown in figure 1 – where the applied force is perpendicular to the sensor),

With regards to claim 16, Ganapathi discloses a reader according to claim 1, wherein the magnetic displacement portion is movable is a direction perpendicular to the surface of the object (see figure 6 – the finger can be place any area as long as the finger is within the 606 area).

With regards to claims 17 and 18, Ganapathi discloses a reader according to claim 1, wherein the magnetic displacement and detecting portion are arranged from a point

(see figure 6 – each 606 area is a micro sensor which uses magnetic field to obtain fingerprint image value), and a plane (see figure 6 – the sensor detects two dimensional image of a finger print).

With regards to claims 21 and 22, Ganapathi discloses a reader according to claim 1, wherein the object is the surface of a fingerprint (see column 3 lines 38 – 42).

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 5, 10 – 14, 19 and 20 are rejected under U.S.C. 103(a) as being unpatentable over Ganapathi ('397) as applied to claim 9 further in view of Ganapathi (US pat no 6,694,822).

With regards to claim 5, Ganapathi ('397) discloses all the limitations discussed in claim 3, but does not disclose the transition layer being composed of FE-Z where Z is Mn. Ganapathi discloses the transition layer being composed of FE-Z where Z is Mn (see

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column 2 lines 20 – 25). One skilled in the art would include Fe-Mn as a transition layer because to pin the transition layer to prevent current from crossing into another magnetic layer to prevent interference between adjacent layers.

With regards to claim 10, Ganapathi ('397) discloses a reader according to claim 9, wherein the

- a resistance value differs depending on a relative angle between magnetization directions of the magnetic layers (see equation 1 where the resistance depends on an angle between magnetization directions of the magnetic layers),
- the magnetic displacement portion comprises a transition material for converting mechanical energy into magnetic energy (see column 5 lines 32 – 43) and
- the magnetization direction of one of the magnetic layers differs depending on a magnetic state of the transition material (see figure 5 – 510).

Ganapathi does not disclose magneto resistive element comprises a multilayer structure that comprises a non-magnetic layer and a pair of magnetic layers sandwiching the non-magnetic layer. Ganapathi ('822) discloses magneto resistive element comprises a multilayer structure that comprises a non-magnetic layer and a pair of magnetic layers sandwiching the non-magnetic layer (see column 8 lines 32 – 38). One skilled in the art would include a non-magnetic layer in the middle because to prevent the magnetic fields from the other two sandwiching layers do not interfere with current flowing minimizing sensor errors.

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With regards to claim 11, Ganapathi ('397) discloses a reader according to claim 10, wherein one of the magnetic layers and the transition material are coupled magnetically (see column 5 lines 17 – 21 – the closure is the boundary of the magnetic field where all the space between the boundary consist of magnetic field holding the layers together).

With regards to claim 12, an extension to the arguments to the rejection of claim 10, Ganapathi ('822) discloses the antiferromagnetic layer is arranged so that the other magnetic layer is sandwiched between the antiferromagnetic layer and the non-magnetic layer (see column 2 lines 57 – 64 and figure 5).

With regards to claim 13, an extension to the arguments to the rejection of claim 10, Ganapathi ('822) discloses one magnetic layer selected from the pair of magnetic layers comprises a non-magnetic film and a pair of magnetic films sandwiching the non-magnetic film (see column 8 lines 32 – 38).

With regards to claim 14, Ganapathi discloses ('397) discloses a reader according to claim 13, wherein magnetic coupling selected from laminated ferromagnetic coupling and magnetostatic coupling is establishing films (see column 5 lines 8 – 21 – the middle layer is laminated, also shown in figure 3).

With regards to claims 19 and 20, see the rationale and rejection for claim 10.



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3. Claim 6 is rejected under U.S.C. 103(a) as being unpatentable over Ganapathi ('397). Ganapathi discloses all the limitations discussed in claim 3, but does not disclose amount change in deformation of the transition material is not less than  $10^{-3}$  %. However, Ganapathi discloses a method to calculate the maximum beam stress and strain on the sensor (see equation 2). The deformation allowed depends on the thickness, width and length of the sensor suggesting to the current claim that this number,  $10^{-3}$  %, is derived on the dimensions of the sensor, which is different for all sensor having different dimensions. One skilled in the art would include calculating maximum beam stress because to prevent the sensor from breaking, which can prevent costly replacements.

4. Claim 8 is rejected under U.S.C. 103(a) as being unpatentable over Ganapathi ('397) as applied to claim 1 further in view of Bonnaval-Lamothe (US pat no 4,817,170).

With regards to claim 8, Ganapathi discloses all the limitations discussed in claim 1, but does not disclose detecting portion comprises a coil. Bonnaval-Lamothe discloses detecting portion comprises a coil and detects the magnetic state by using the coil (see column 3 lines 50 – 54). One skilled in the art would include detecting portion comprises a coil because a coil is a circular metallic string, which allows current to pass through to generate force when force is applied to the coil, preventing any stress beam / sensor to break.

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5. Claim 23 is rejected under U.S.C. 103(a) as being unpatentable over Ganapathi ('397) in view of official notice (MPEP 2144.03).

With regards to claim 23, see the rationale and rejection for claim 1. In addition, Ganapathi does not discuss a matching portion where matching portion matches the shape in the memory with the displacement portion input shape. However, Ganapathi does discuss using the magnetic-resistive sensor for identification and verification of an individual (see column 7 lines 27 – 45). It is well known in the art to store templates of individuals' fingerprint in order to identify and / or verify an individual. One skilled in the art would include a matching portion because to calculate a similarity value for all the shape displacement a memory to find the best value which identifies the user trying to access a secure facility.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Liew whose telephone number is (571)272-8623. The examiner can normally be reached on 9:30AM - 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**Alex Liew**  
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**6/22/07**



JOSEPH MANCUSO  
SENIOR PATENT EXAMINER